

## REMARKS

This amendment is in response to the Office Action, Paper No. 08242005, dated on the 8<sup>th</sup> of September, 2005.

### **Status of Claims**

Claims 1 through 20 are pending. Claim 1 is rejected under U.S.C. 103(a) as being unpatentable over Ishida, U.S. Patent number 6,326,938, in view of Lo, U.S. Patent Number 6,483,490. Claims 2 through 20 are objected to as being dependent upon a rejected base claim.

Claim 1 is amended for the purpose of clarity, and claim 2 is amended as an independent form including all of the limitations of the base claim. Claims 21 through 28 are newly added. No new matter has been added to the new claims. The Applicant appreciates the Examiner's indication of allowability concerning claims 2 through 20.

### **Rejection of claim 1 under 35 U.S.C. 103(a)**

Claims 1 is rejected under U.S.C. 103(a) as being unpatentable over Ishida et al. (U.S. Patent number 6,326,938), in view of Lo et al. (U.S. Patent Number 6,483,490). Applicant respectfully traverses the Examiner's rejection as follows.

In support of the rejection, the Examiner wrote in part:

“Lo discloses collecting excess charges remaining in the display cells when said applying of the display data signals ends, said collecting being performed by a power recovery circuit (702 and

704) included in the address driver (col. 6, lines 20-25);

applying the collected changes to the display cells when said applying of the display data signals starts; and controlling operation and non-operation of the power recovery circuit in dependence upon said applying of the display data signals to the address electrode lines (col. 4, lines 27-36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the power consumption control as disclosed by Ishida the energy recovery circuit as disclosed by Lo, to enhance the brightness and efficiency of the luminance.”

First, Lo et al. ‘490 discloses an energy recovery circuit (702 or 704) but the circuit is not included in the address driver. It would not have been obvious to include the energy recovery circuit in the address driver due to the following reasons.

Lo et al. ‘490 discloses that the energy recovery circuit 702 is connected to the sustain electrode X and the energy recovery circuit 704 is connected to the sustain electrode Y.<sup>1</sup> The energy recovery circuit is included in a driving circuit for sustaining waveform.<sup>2</sup>

Sustain electrode X and Y are disposed in pairs to be parallel with each other on the front substrate, and address electrode A is disposed on the rear glass substrate orthogonal to the electrodes X and Y.<sup>3</sup> The pulses being applied to the address electrode is controlled by an address driver and

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<sup>1</sup> Col. 5, lines 43-45 of Lo et al. ‘490

<sup>2</sup> Col. 5, lines 35-42 of Lo et al. ‘490

<sup>3</sup> Col. 4, lines 5-10 of Lo et al. ‘490

the pulses being applied to electrodes X and Y are controlled by a common driver and a Y scan driver, respectively.<sup>4</sup>

The functions of the address driver and the drivers for electrode X and Y are different. A frame of driving pulses for plasma display panel consists of an address period and a sustained-discharge period following the address period. Address pulses during the address period is selectively applied *between a Y electrode and an address electrode*, and during a sustained-discharge period, sustain pulses are applied *between all the Y electrodes and all the X electrodes*.<sup>5</sup> The address pulse is to selectively store charges in the corresponding display cell, and the sustaining pulse is to cause the display cell to glow.<sup>6</sup> Address pulse is applied only during the address period, while sustain pulse only during the sustained-discharge period.

The object of Lo et al. '490 is to improve the luminous efficiency.<sup>7</sup> Because the luminous efficiency is determined by the waveform being applied to the sustain electrodes during the sustain period, the energy recovery circuit is integrated in the driving circuit for sustaining waveform. The entire driving circuit including the energy recovery circuit operates to improve the luminous efficiency.<sup>8</sup>

The present invention provides a method of driving a 3-electrode plasma display apparatus

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<sup>4</sup> FIG. 1 of Ishida et al. '938

<sup>5</sup> Col. 2, line 66 - col. 3, line 7 of Ishida et al. '938

<sup>6</sup> Col. 3, lines 1-7 of Ishida et al. '938

<sup>7</sup> Col. 2, lines 14-16 of Lo et al. '490

<sup>8</sup> Col. 6, line 26 - col. 7, line 31 of Lo et al. '490

through which generation of unnecessary addressing power is prevented (7<sup>th</sup> paragraph of the specification). This process is achieved by adaptively reflecting the characteristic of video data. The Applicant discloses a waveform of display data applied to address electrode in FIG. 8A when the power recovery circuit is operated. It should be noted that intermittent pulses are applied to the waveform of display data in accordance with the operation of the power recovery circuit, even though there is no change in the ON data (55<sup>th</sup> and 56<sup>th</sup> paragraphs). The changes of the waveform of display data would not be suggested by combining the references, Lo et al. '490 and Ishida et al. '938.

Therefore, it would not have been obvious for those skilled in the art to modify the energy recovery circuits of Lo et al. '490 to be included in the address driver in the view of Ishida et al. '938, because the functions and timing of pulse application of the address driver are different from those of drivers for sustain pulses.

Second, there is no suggestion in Lo et al. '490 and Ishida et al. '938 for controlling operation and non-operation of the power recovery circuit in dependence upon said applying of the display data signals to the address electrode lines. Lo et al. '490 teaches operation of the energy recovery circuit corresponding the sustaining pulse during the sustain period.<sup>9</sup> Because display data signals are supplied only by address driver, there is no display data signal in the sustaining pulse. Therefore, there is no dependence of the energy recovery circuit of Lo et al. '490 on the display data signals,

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<sup>9</sup> Col. 4, line 61, col. 5, lines 35-36, and FIG. 8 of Lo et al. '490

because the energy recovery circuit is included in the driver for sustaining pulses.

Lo et al. '490 further discloses that the energy recovery circuit is operated in the full cycle of the sustain period<sup>10</sup>, and never suggests controlling operation and non-operation of the energy recovery circuit. In the rejection, the Examiner incorrectly interpreted the col. 4, lines 27-36 of Lo et al. '490. The method described in the col. 4, lines 27-36 of Lo et al. '490 is not a method for controlling operation and non-operation of the energy recovery circuit, but a method for driving plasma display panel, which also could be found in the col. 2, line 66 through col. 3, line 7 of Ishida et al. '938. Therefore, the combination of references, Ishida et al. '938 and Lo et al. '490, does not teach or suggest all the claimed features.

Third, there is no motivation to include in the power consumption control of Ishida et al. '938 the energy recovery circuit of Lo et al. '490, to enhance the brightness and efficiency of the luminance. The Examiner "must identify specifically ... the reasons one of ordinary skill in the art would have been motivated to select the references and combine them."<sup>11</sup> The object of Lo et al. '490 is to improve the luminous efficiency with power recovery<sup>12</sup>, while the object of Ishida et al. '938 is to provide power consumption control without unnatural changes in brightness.<sup>13</sup> The power consumption control of Ishida et al. '938 is achieved by controlling screen brightness based on the

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<sup>10</sup> Col. 7, lines 32-34 of Lo et al. '490

<sup>11</sup> In re Dembiczak, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed. Cir. 1999)

<sup>12</sup> Col. 2, lines 14-20 of Lo et al. '490

<sup>13</sup> Col. 1, lines 53-58 of Ishida et al. '938

calculated load ratio and the measured power consumption<sup>14</sup>, while Lo et al. '490 saves energy by recovering the energy stored in the panel capacitance.<sup>15</sup>

There would have been no motivation to combine the energy recovery circuit of Lo et al. '490 with the power consumption control of Ishida et al. '938, because the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.<sup>16</sup>

In conclusion, the withdrawal of the rejection is respectfully requested. Claim 1 is amended to unambiguously describe the invented method of driving a 3-electrode plasma display apparatus, based on the original specification. No new matter is introduced in this amended claim. The allowance of the claim 1 is respectfully requested.

**Allowable subject matter**

The Examiner stated that claims 2 through 20 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Following the advice of the Examiner, claim 2 is amended in an independent form including all of the limitations of the base claim and any intervening claims. Therefore, claims 2 through 20 should be allowable.

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<sup>14</sup> Col. 1, lines 59-65 and FIG. 5 of Ishida et al. '938

<sup>15</sup> Col. 6, lines 20-25 of Lo et al. '490

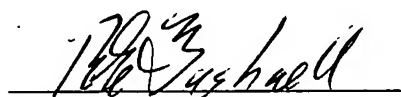
<sup>16</sup> MPEP § 2143.01

**Conclusion**

In view of the above debate, the foregoing amendment, and remarks, all claims are deemed allowable and this application is believed to be in condition to be passed to issue. If there is any question, the Examiner is asked to contact the Applicant's attorney.

A fee of \$600.00 is incurred by the addition of 8 total claims in excess of 20 and 1 independent claim in excess of 3. Applicant's check drawn to the order of Commissioner accompanies this Amendment. Should the check become lost, be deficient in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "R. E. Bushnell", is written over a horizontal line.

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